

ABSTRACT OF THE DISCLOSURE

A semiconductor device having a contact structure that can exhibit superlative step coverage without causing voids or wiring discontinuities, using aluminum or aluminum alloys as a conductive substance for via-holes. A method of fabricating the semiconductor device comprises, for at least one layer of wiring regions above the first wiring region on a semiconductor substrate, the following steps (a) to (f): (a) a step of forming a via-hole in a second interlayer dielectric formed above the first wiring region on a semiconductor substrate; (b) a degassing step for removing gaseous components included within the interlayer dielectric by a heat treatment under reduced pressure and at the substrate temperature of 300°C to 550°C; (c) a step of forming a wetting layer on the surface of the interlayer dielectric and the via-hole; (d) a step of cooling the substrate to a temperature of no more than 100°C; (e) a step of forming a first aluminum layer comprising one of aluminum and an alloy in which aluminum is the main component on the wetting layer at a temperature of no more than 200°C; and (f) a step of forming a second aluminum layer comprising one of aluminum and an alloy in which aluminum is the main component on the first aluminum layer at a temperature of at least 300°C.